15. The article of manufacture of claim **13**, wherein the implicit volumetric representations of the object comprise level-sets of 3D scalar fields.

16. The article of manufacture of claim **10**, wherein the plurality of lattice template structures are assigned to location in the uniform grid structure according to an optimization problem.

17. The article of manufacture of claim **16**, wherein the optimization problem is solved using a graph and tree search technique.

18. The article of manufacture of claim **17**, wherein the graph and tree search technique comprises a branch and bound technique.

19. A system partitioning a model to facilitate printing of the model on a three-dimensional printer, the system comprising:

one or more processors;

a non-transitory, computer-readable storage medium in operable communication with the processors, wherein the computer-readable storage medium comprises one or more programming instructions that, when executed, cause the processors to:

generate a plurality of lattice template structures based on a user-specified 3-D model of an object,

determine material behaviors for each of the plurality of lattice template structures using user-specified functional specifications, and

generate a printable lattice by assigning the plurality of lattice template structures to locations in a uniform grid structure based on material behaviors of the lattice template structures;

one or more 3-D printers configured to print representations of the object based on the printable lattice.

20. The system of claim **19**, further comprising:

a parallel processing platform comprising the one or more processors and configured to determine the material behaviors for two or more of the lattice template structures in parallel.

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